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**METALLURGICAL STUDY OF DISSIMILAR WELDING OF NITI SHAPE MEMORY ALLOY TO AISI 304 STAINLESS STEEL**

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NiTi Shape Memory Alloys (SMA) are a unique and special class of materials with capacity to recover pseudo plastic strains when temperature is changed, contrary of the most commonly used metals. The main limitation in dissimilar welding between NiTi SMA and Stainless Steels (SS) is within the joint brittle due the formation of intermetallic compounds with high hardness, like Fe<sub>2</sub>Ti and (Fe, Ni)Ti. In large amounts, these compounds weaken the joint. The primary objective of this work was to weld thin NiTi SMA and AISI 304 SS sheets (1mm) and then evaluate their microstructure when different filler metals are used. In order to weld the sheets it was used a Micro TIG Digiplus A7 welder with pre-established parameters. After welding, the joints were analyzed using Optical and Scanning Electron Microscopy (SEM), as well as Energy Dispersion Spectroscopy (EDS). Furthermore, it was measured the micro hardness Vickers' profile within the base metals, the heat affected zone, and the welded zone. The mechanical strength of the dissimilar welded joints was determined by uniaxial tensile tests. Qualitatively, results have shown the efficiency of the weld with few presences of defects. The tensile strength was variable for the different filler metals used. Also, the microstructure analysis revealed a non-uniform weld zone, with possible formation of intermetallic elements. The micro hardness tests provided a variant hardness profile with local peaks in regions favorable to the formation of brittle intermetallic compounds.